

428 Recd PCT/PTD 06 MAR 2000

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| U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE | | ATTORNEY'S DOCKET NUMBER |
| FORM PTO-1390 (REV 11-98) | | P/613-111 |
| TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371 | | U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 09/508031 |
| INTERNATIONAL APPLICATION NO. PCT/ES98/00243 | INTERNATIONAL FILING DATE 4 September 1998 | PRIORITY DATE CLAIMED 5 September 1997 |
| TITLE OF INVENTION COMPOSITION ATTRACTIVE TO INSECTS PERTAINING TO THE COLEOPTERA ORDER AND ITS APPLICATION TO PEST CONTROL IN PALM TREE | | |
| APPLICANT(S) FOR DO/EO/US Jose ESTEBAN DURAN et al. | | |
| Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information. | | |
| <p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input checked="" type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).</p> <p>4. <input type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) a. <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). b. <input checked="" type="checkbox"/> has been transmitted by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US).</p> <p>6. <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</p> <p>7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> have been transmitted by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input type="checkbox"/> have not been made and will not be made.</p> <p>8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</p> <p>9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</p> <p>10. <input checked="" type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p> | | |
| Items 11. to 16. below concern document(s) or information included: | | |
| <p>11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</p> <p>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</p> <p>13. <input checked="" type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.</p> <p>14. <input type="checkbox"/> A substitute specification.</p> | | |
| EXPRESS MAIL CERTIFICATE | | |
| <p>15. <input type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>16. <input checked="" type="checkbox"/> Other items or information: PCT forms.</p> | | |
| <p>I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail Post Office to Addresses (mail label <u>EL075472105US</u>) in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on <u>March 6, 2000</u></p> <p><u>Dorothy Jenkins</u> Name of Person Mailing Correspondence <u>Dorothy Jenkins</u> Signature <u>March 6, 2000</u> Date of Signature</p> | | |

| U.S. APPLICATION NO. (if known, see 37 CFR 1.5) | INTERNATIONAL APPLICATION NO | ATTORNEY'S DOCKET NUMBER | | | | | | | | | | | | | | | | |
|--|------------------------------|---------------------------|--------------|--------------|------|--------------|-----------|---|-----------|--------------------|---------|---|-----------|---|---|--|------------|----|
| 09/508031 | PCT/ES98/00243 | P/613-111 | | | | | | | | | | | | | | | | |
| 17 <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO..... \$970.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$840.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$760.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$670.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$96.00 | | CALCULATIONS PTO USE ONLY | | | | | | | | | | | | | | | | |
| ENTER APPROPRIATE BASIC FEE AMOUNT = | | \$ 840. | | | | | | | | | | | | | | | | |
| Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)). | | \$ | | | | | | | | | | | | | | | | |
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">CLAIMS</th> <th style="width: 30%;">NUMBER FILED</th> <th style="width: 20%;">NUMBER EXTRA</th> <th style="width: 35%;">RATE</th> </tr> </thead> <tbody> <tr> <td>Total claims</td> <td>13 - 20 =</td> <td>0</td> <td>X \$18.00</td> </tr> <tr> <td>Independent claims</td> <td>1 - 3 =</td> <td>0</td> <td>X \$78.00</td> </tr> <tr> <td>MULTIPLE DEPENDENT CLAIM(S) (if applicable)</td> <td>0</td> <td></td> <td>+ \$260.00</td> </tr> </tbody> </table> | | CLAIMS | NUMBER FILED | NUMBER EXTRA | RATE | Total claims | 13 - 20 = | 0 | X \$18.00 | Independent claims | 1 - 3 = | 0 | X \$78.00 | MULTIPLE DEPENDENT CLAIM(S) (if applicable) | 0 | | + \$260.00 | \$ |
| CLAIMS | NUMBER FILED | NUMBER EXTRA | RATE | | | | | | | | | | | | | | | |
| Total claims | 13 - 20 = | 0 | X \$18.00 | | | | | | | | | | | | | | | |
| Independent claims | 1 - 3 = | 0 | X \$78.00 | | | | | | | | | | | | | | | |
| MULTIPLE DEPENDENT CLAIM(S) (if applicable) | 0 | | + \$260.00 | | | | | | | | | | | | | | | |
| TOTAL OF ABOVE CALCULATIONS = | | \$ 840.00 | | | | | | | | | | | | | | | | |
| Reduction of 1/2 for filing by small entity, if applicable. A Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28). | | \$ | | | | | | | | | | | | | | | | |
| SUBTOTAL = | | \$ 840.00 | | | | | | | | | | | | | | | | |
| Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)). | | \$ | | | | | | | | | | | | | | | | |
| TOTAL NATIONAL FEE = | | \$ 840.00 | | | | | | | | | | | | | | | | |
| Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property | | + | | | | | | | | | | | | | | | | |
| TOTAL FEES ENCLOSED = | | \$ 840.00 | | | | | | | | | | | | | | | | |
| | | Amount to be: \$ | | | | | | | | | | | | | | | | |
| | | refunded \$ | | | | | | | | | | | | | | | | |
| | | charged \$ | | | | | | | | | | | | | | | | |
| a. <input checked="" type="checkbox"/> A check in the amount of \$ 840.00 to cover the above fees is enclosed. Check No. 9069 | | | | | | | | | | | | | | | | | | |
| b. <input type="checkbox"/> Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed. | | | | | | | | | | | | | | | | | | |
| c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 15-0700. A duplicate copy of this sheet is enclosed. | | | | | | | | | | | | | | | | | | |
| NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status. | | | | | | | | | | | | | | | | | | |
| SEND ALL CORRESPONDENCE TO OSTROLENK, FABER, GERB & SOFFEN, LLP 1180 Avenue of the Americas New York, NY 10036-8403 | | | | | | | | | | | | | | | | | | |
|  SIGNATURE. Edward A. Meilman NAME | | | | | | | | | | | | | | | | | | |
| Tel: (212) 382 0700 24,735 REGISTRATION NUMBER | | | | | | | | | | | | | | | | | | |

09/508031

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P/613-111

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of
José Rafael ESTEBAN DURAN et al
Serial No.:
Filed:

New York, New York
Date: March 6, 2000
Group Art Unit:
Examiner:

For: COMPOSITION ATTRACTING INSECTS PERTAINING TO THE COLEOPTERA FAMILY AND USE THEREOF IN THE CONTROL OF PLAGUES IN PALM-TREES AND RELATED PLANTS

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Prior to examination, please amend the application as follows:

IN THE CLAIMS:

Please amend claim 12 as follows.

Claim 12, line 3, change "any of claims 1 to 11" to
--claim 1--.

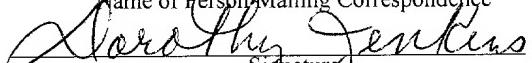
REMARKS

This Preliminary Amendment is submitted to change the multiple dependent claim to a single dependent claim in order to reduce the government filing fee.

EXPRESS MAIL CERTIFICATE

Respectfully submitted,


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Dorothy Jenkins
Name of Person Mailing Correspondence

Signature
March 6, 2000
Date of Signature

09/508031

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P/613-111

COMPOSITION ATTRACTIVE TO INSECTS PERTAINING TO
THE COLEOPTERA ORDER AND ITS APPLICATION TO PEST
CONTROL IN PALM TREES AND RELATED PLANTS

INVENTORS:

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(212 382 0700)

Serial or Patent No.: 09/508,031 OFCS File No. P/613-111
Filing or Issue Date: March 6, 2000
Applicant or Patentee: Jose Rafael ESTEBAN DURAN, et al.
For: COMPOSITION ATTRACTIVE TO INSECTS PERTAINING TO THE COLEOPTERA ORDER AND ITS
APPLICATION TO PEST CONTROL IN PALM TREES AND RELATED PLANTS
VERIFIED STATEMENT (DECLARATION) CONCERNING ENTITY STATUS
37 CFR 1.9(f) and 1.27(c) - SMALL BUSINESS CONCERN

I hereby declare that with regard to the small business concern identified below I am
 the owner of the small business concern
 an official of the small business concern empowered to act on behalf of same
NAME OF CONCERN: Instituto Nacional de Investigacion y Tecnologia Agraria y Alimentaria
ADDRESS OF CONCERN: Jose Abascal, 56, 28003 Madrid Spain

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 37 CFR 1.11.3-18, and reproduced in 37 CFR 1.9(d), for purposes of paying reduced fees under 35 USC §41(a) and (b) in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns the affiliates of each other when either, directly or, indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention entitled
COMPOSITION ATTRACTIVE TO INSECTS PERTAINING TO THE COLEOPTERA ORDER... by inventor(s)

Jose Rafael ESTEBAN DURAN, et al. described in
 U.S. Patent Application filed herewith
 U.S. Patent Application Serial No. 09/508,031 filed March 6, 2000
 U.S. Patent No. issued

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having the rights to the invention is listed below* and no rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 CFR 1.9(c) or by any concern which would not qualify as a small business concern under 37 CFR 1.9(c) or a non-profit organization under 37 CFR 1.9(e). *NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention according to their status as small entities. 37 CFR 1.27.

NAME: _____
ADDRESS: _____
[] INDIVIDUAL [] SMALL BUSINESS CONCERN [] NON-PROFIT ORGANIZATION
NAME: _____
ADDRESS: _____
[] INDIVIDUAL [] SMALL BUSINESS CONCERN [] NON-PROFIT ORGANIZATION

I acknowledge the duty to file in this patent application or patent, notification of any change of status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. 37 CFR 1.29(b).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 USC §1001, and that such willful false statements may jeopardize the validity of the patent application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING: Francisco José Simón Vila (Presidente del INIA)
ADDRESS OF PERSON SIGNING: José Abascal, 56 - 28003 MADRID (ESPAÑA)

SIGNATURE: _____ DATE: _____

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COMPOSITION ATTRACTIVE TO INSECTS PERTAINING
TO THE COLEOPTERA ORDER AND ITS APPLICATION TO
PEST CONTROL IN PALM TREES AND RELATED PLANTS

5 The composition consists in a semi-synthetic mixture
(a) comprising (a1) an organic compound emitted mainly from
the fermentation of vegetal portions of the palm tree or
related plant, (a2) a ground, fermented, stabilized vegetal
matter deriving from the palm tree or related plant, and
10 (a3) an organic compound emitted to a lesser degree during
fermentation of the vegetal portions of the palm tree or
related plant; and (b) a feromone adequate for the insect
to be controlled. The method consists in applying said
composition over the grove of palm trees or related plants
15 requiring protection. The composition and the method have
an agricultural application.

COMPOSITION ATTRACTIVE TO INSECTS PERTAINING
TO THE COLEOPTERA ORDER AND ITS APPLICATION TO
PEST CONTROL IN PALM TREES AND RELATED PLANTS

5 FIELD OF THE INVENTION

This invention relates to compositions for attracting insects pertaining to the Coleoptera order, and are formed by a semi-synthetic combination comprising chemical products emitted from the natural fermentation of plants 10 and fermented vegetal products, in addition to feromones that are adequate for the insect to be controlled, and also to the use of said attractive compositions in a method designed for pest controlling said insects in palm trees and related plants.

15 BACKGROUND OF THE INVENTION

The various uses of vegetal products deriving from palmaceous plants and its various species (palm oil, coconut oil, coconuts, dates, etc.) are presently suffering considerable losses as a result insects attacks on 20 plantation areas, mainly in equatorial, tropical, subtropical and/or warm areas of the planet.

The insects which mainly attack palm trees belong to the Coleoptera Curculionidae order, *Rhynchophorinae*, and the *Oryctes*, *Scapanes* and, mainly, *Rhynchophorus* genera. 25 Particularly, the *Rhynchophorus palmarum* and *Rhynchophorus ferrugineus* species are curculionids which constitute a very serious pest affecting palm trees in humid equatorial and tropical zones of the globe. Recently, the *R. ferrugineus* species affecting date palms in the Middle East 30 and Northern Africa has been detected in ornamental palm trees in the Málaga and Granada coast.

Numerous studies reveal that one of the few valid and efficient insect pest control methods available, particularly for preventing the insect's natural expansion, 35 consists in its mass-trapping.

In the case of curculionid pests affecting palm trees, the only prospective and/or control methods which have proven to be effective are based on the capture of adult insects of virtually damaging species both as a prognosis 5 and a direct control method through mass-trapping. These methods use a vegetal bait combined with the added feromone of each species to be controlled. However, the ecology itself of the plantation environments provide for limited effectiveness of said vegetal baits, in view that, under the 10 best circumstances, bait life rarely exceeds 15 days, and it is therefore necessary to constantly replace the bait and to overcome operational difficulties which complicate the treatment and render it more expensive. Moreover, vegetal baits provide irregular results because of the 15 heterogeneity of the vegetal substance in the fermentation.

Thus, the need exists for other insect pest control methods based on the use of baits designed to attract insects that will overcome these inconveniences.

The invention provides a solution to this need based 20 on the use of a composition attractive to insects formed of a semisynthetic combination comprising chemical products emitted from vegetal fermentation, in a natural manner, and from ground, mixed portions of the plants proper.

Therefore, an object of this invention consists in 25 providing a semisynthetic mixture or combination comprising at least one organic compound emitted during the fermentation of vegetable portions of palm trees and related plants and a ground, fermented vegetal matter taken from said plants. The procedure for obtaining the mixture 30 constitutes an additional object of the invention.

Another object of this invention consists in providing a composition attractive to insects that is appropriate for controlling pests of insects, pertaining to the Coleoptera order, in palm trees and related plants, comprising the 35 above mentioned semisynthetic mixture and a feromone

corresponding to the insect to be controlled. The procedure for obtaining said composition constitutes a further object of the invention.

Finally, another object of this invention consists in 5 providing a method for controlling pests of insects pertaining to the Coleoptera order, in palm trees and related plants, which includes the use of said compositions that attract insects.

DETAILED DESCRIPTION OF THE INVENTION

10 The invention provides adequate mixtures for producing compositions that are attractive to insects and prove useful for controlling pests of insects pertaining to the Coleoptera order in palm trees and related plants. In the sense used in this description, the term "palm trees and/or 15 related plants" includes all types and species of palm trees, in addition to related plants such as sugar cane, banana trees and agaves.

Mixture (a) provided by the present invention comprises the following components:

- 20 (a1) an organic compound selected from the group of compounds providing the main fermentation emission from vegetal portions of the palm tree or related plant; and
- 25 (a2) a vegetal matter comprising vegetal portions from the palm tree or related plant that, is ground, fermented and stabilized with a preserving agent.

Mixture (a) may also optionally contain a component 30 (a3) selected from the group of compounds forming the lesser emission from the fermentation of vegetal portions of the palm tree or related plant.

Component (a1) is an organic compound selected from the group of compounds comprising the main emission from the fermentation of vegetal portions of the plant in 35 question, as chromatographically detected in the natural

fermentation of said vegetal matter. Generally, in the case of palm trees, sugar cane, banana trees and agaves, the compounds included in said main emission are organic compounds selected among alcohols, such as methanol and 5 ethanol, and esters, such as ethyl acetate. Therefore, in a particular embodiment of this invention, said component (a1) is selected from the group formed by methanol, ethanol, ethyl acetate and its mixtures. Component (a1) may be present in an amount between 15% and 85% by weight of 10 the total mixture, preferably between 70% and 80% thereof.

Compound (a2) is a vegetal matter comprising vegetal portions of the plant which are ground, fermented and stabilized with a preserving agent. The vegetal portions liable to be used are the stem, leaves and fruits of the 15 plants in question (palm trees, sugar cane, banana trees or agaves). The vegetal portions used are crushed and milled, are allowed to ferment naturally for an adequate period of time and are then stabilized with an appropriate preserving agent, e.g. ascorbic acid, nitric acid or similar. Thus, in 20 a particular embodiment of this invention, component (a2) is selected from the group formed by stems, leaves, fruits and mixtures thereof from palm trees, sugar cane, banana trees or agaves that are ground, allowed to ferment naturally and stabilized with a preserving agent selected 25 between ascorbic acid, nitric acid and its mixtures. Component (a2) may be present in mixture (a) in an amount between 15% and 85% by weight of the total mixture, preferably between 19% and 29% thereof. The preserving agent present in component (a2) is found in an amount 30 appropriate for performing its function.

Compound (a3) is an organic compound selected from the group of compounds forming the lesser emission from the fermentation of vegetal portions of the plant in question, chromatographically detected in the natural fermentation of 35 said vegetal matter. These minority compounds are of a

varied nature and chemical composition; however, in general, in the case of palm trees, sugar cane, banana trees and agaves, the compounds included in said lesser emissions include, among numerous other compounds, isobutyl acetate, acetoin, phenol, guaiacol, menthol and 2-phenylethanol. Therefore, in a particular embodiment of this invention, said component (a3) is selected from the group formed by acetoin, phenol, guaiacol, 2-phenylethanol and mixtures thereof. Component (a3) may be present in said mixture in an amount between 0 and 20% by weight of the total mixture, preferably between 1% and 5% thereof. Component (a3) enhances, according to the ecosystem involved, the attraction of one or another species of insects in response to a common aggregation feromone.

Mixture (a) may be obtained through a procedure comprising the general stages of preparing component (a2) and mixing it with component (a1), and optionally with component (a3).

The preparation of component (a2) may be readily conducted at ambient temperature, namely 18 to 25°C, by first grinding and mixing the vegetal portions being used, e.g. stems, leaves and fruits, subsequently spreading the mixture over plates made from an inert material such as stainless steel, glass or neutral plastics, and allowing it to ferment at a temperature ranging from 20 to 25°C for a period of time ranging from 24 to 48 hours. The mixture obtained is then stabilized with an adequate preserving agent, such as ascorbic acid, citric acid and/or mixtures thereof, to obtain component (a2).

To the component (a2) thus obtained is added component (a1) - e.g. an organic solvent selected between methanol, ethanol, ethyl acetate and mixtures thereof - and, optionally, if so desired, component (a3). After adding these components, the resulting combination is stirred evenly for an adequate period of time, normally under 60

minutes, to obtain mixture (a). This mixture (a) may then be used for preparing a composition that attracts insects, or, if so desired, is placed inside appropriate containers, such as hermetic containers, and preserved in a 5 refrigerator or freezer until such time as they are needed.

These mixtures (a), or so-called "semisynthetic combinations" because they are obtained from natural products (vegetal portions) and chemical products, are appropriate for producing compositions which attract 10 insects pertaining to the Coleoptera order in plantations selected from the group formed by all types and species of palm trees, sugar cane plantations, banana trees, agave zones and mixtures thereof.

The insect-attracting compositions, or so-called 15 semisynthetic baits, provided by this invention comprise the following components:

- (a) a mixture including
 - (a1) an organic compound selected from the group of compounds providing the main fermentation emission from vegetal portions of the plant in question;
 - (a2) a vegetal matter comprising vegetal portions from the plant in question that is ground, fermented and stabilized with a preserving agent; and optionally
 - (a3) an organic compound selected from the group of compounds providing the lesser emission from the fermentation of vegetal portions of the plant in question; and
 - 30 (b) a feromone corresponding to the insect the pest of which is intended to be controlled.
- Mixture (a) and its components (a1), (a2) and (a3) have been previously defined.
- Component (b) is a feromone corresponding to the 35 insect the pest of which is intended to be controlled. This

feromone may be a synthetic feromone, preferably a synthetic sexual feromone pertaining to the species of insect the pest of which is intended to be controlled, e.g. Rhynchophorol, a synthetic feromone useful for controlling 5 insects of the *Rhynchophorus* genus. Synthetic feromones, the synthesis of which can be achieved through conventional chemical means, are known, commercially available products. Component (b) may be present in the attracting composition provided by this invention in an appropriate quantity.

10 The attracting compositions of the invention present a liquid consistency and leave and leave a steady sediment on the bottom of the container used for the application which gradually delivers the precise components to the composition, as required for the latter to remain active 15 and maintain the desired attraction properties.

The procedure for fabricating the insect attracting composition provided by this invention comprises the stages of preparing the mixture (a) and loading said mixture with the corresponding feromone. The preparation of mixture (a) 20 has been previously described. Loading of the feromone may be performed by conventional methods which normally comprise placing mixture (a) in contact with the feromone in their liquid phase.

The insect attracting composition of this invention is 25 suitable for controlling insect pests in plants; it is particularly suitable for controlling insects pertaining to the Coleoptera order and embraces virtually all *Rhynchophorinae*, in addition to *Metamassius* sp., *Scapanes* sp., *Oryctes* sp., etc., in all types and species of palm 30 trees, in mixed or non-mixed sugar cane and banana tree plantations, and in agave areas.

Thus, the invention also provides a method for controlling insect pests, particularly for controlling insects pertaining to the Coleoptera order in all types and 35 species of palm trees, in mixed or non-mixed sugar cane and

banana tree plantations and in agave areas, involving the use of the insect attracting composition provided by this invention. More specifically, the method for controlling insect pests comprises applying a suitable amount of said 5 insect attracting composition, loaded with the corresponding feromone based on the insect the pest of which is intended to be controlled, on the grove intended to be protected.

In the sense used in this description, the term 10 "insect pest control" includes detecting and fighting said insects.

Applied as a prognosis (detection) method, one trap (with semisynthetic bait and its corresponding feromone) may be installed for every 4 or 5 hectares, although the 15 local experts will always be required to establish the most adequate density based on the species of insects being acted against.

By using the mass-trapping method of fighting against species which so allow, trap density call for installing at 20 least one trap per hectare, obviously based on the opinion of the experts and the species of insects to be trapped.

The insect attracting composition may be applied through conventional methods and with the use of conventional equipment and devices applied to normal insect 25 pest handling and control methods, particularly involving devises used for applying vegetable baits. Alternatively, disperser systems may be used comprising a material capable of absorbing or adsorbing the insect attracting composition of the invention and progressively releasing it, optionally 30 enveloped by a hydrosoluble film.

When using the insect attracting composition of the invention, it is most important that, while in the storage containers and prior to loading the spreaders, the composition is thoroughly stirred to enable all liquid and 35 semisolid (sediment) compounds comprised in the insect

attracting composition of the invention to be homogeneously incorporated to each spreader, thus allowing the sediment to gradually release the minority compounds, i.e. compound (a3), from the fermentation of the treated vegetal portions 5 discontinued as a result of the cold storage but which nonetheless is slowly resumed as the composition is being used.

Tests conducted in French Guiana against *Rhynchophorus palmarum* and in Spain against *Rhynchophorus ferrugineus* 10 Olivier using suitable insect attracting compositions of the invention with their respective aggregation feromones have provided far better results than those of normally utilized vegetal baits (sugar cane and/or palm tree medulla fermented during 24-48 hours). During the first week of 15 use, the performance of the inventive compositions reflects an average efficiency of 120% in respect to the vegetal reference specimen, a value which is distinctively higher; however, as from the seventh day and up to the thirtieth day (a 1-month period), the efficacy of the compositions of 20 the invention using vegetal bait surpass 1.000%. The tests conducted in Spain (Almuñécar and Granada) have been implemented on *Rhynchophorus ferrugineus* Olivier, using the feromone and the mixtures provided by this invention, the net results revealing a 560% efficacy over the vegetal 25 reference specimen also provided with its feromone (data not shown).

These results reflect the stability of the insect attracting composition of the invention for the duration of at least one month and capable at all times of emitting the 30 volatile molecules of its components, versus a vegetal bait which normally dries up within 4 to 7 days or rots completely, thus ceasing to emit the precise volatiles.

The results shown in Table 1 (Example 1) furthermore reveal a certain synergic effect deriving from the insect 35 attracting compositions of this invention because of the

presence of compounds emitted to a lesser degree from the fermentation of the vegetal material, i.e component (a3).

The insect attracting compositions provided by this invention and their application to insect pest control in 5 plants offer the following advantages:

- longer bait life, thus simplifying the putting into service of the insect control method,
- improved performance, as compared to methods based on entirely vegetal baits,
- 10 - increased performance regularity as a result of lower vegetal matter content in the bait, and
- lower costs.

The following example serves to illustrate a particular form of embodiment of the object of this 15 invention, and should not be construed as restrictive of the scope of the invention.

EXAMPLE 1

Study of *Rhynchophorus palmarum* control in palm tree groves

This experiment was designed to assess the control of 20 *Rhynchophorus palmarum* control in ornamental palm trees and in coconut palms according to the characteristics indicated hereunder.

- Insect species against which the experiment was designed: *Rhynchophorus palmarum*, Coleoptera curculionidae, 25 *Rhynchophorinae*.

- Testing area: Cayenne - Remire Montjoly, French Guiana.

- Plants: Ornamental palm tree groves and coconut palms.

30 - Dates: March-May 1997.

- Substances tested:

- (a) Vegetal bait (sugar cane in 25 cm lengths cut lengthwise through the middle and fermented during 24 hours at 28°C, and 35 Rhynchophorol (synthetic feromone).

- (b) INIA 1 composition and Rhynchophorol.
(c) INIA 2 composition and Rhynchophorol.
(d) INIA 3 composition and Rhynchophorol.
(e) Reference specimen (only Rhynchophorol).

5 - INIA compositions:
- INIA 1: Ethyl acetate - 40%
Ethanol - 40%
Ground, stabilized sugar cane - 20%
- INIA 2: Ethyl acetate - 35%
10 Ethanol - 35%
Ground, stabilized sugar cane and
coconut fruit, stabilized with
ascorbic acid - 25%
Phenol - 2.5%
Acetoin - 2.5%
15 - INIA 3: Ethyl acetate - 35%
Ethanol - 35%
Sugar cane and coconut
(same as INIA 2) - 20%
Acetoin - 2.5%
20 Phenol - 2.5%
Guaiacol - 2.5%
2-phenylethanol - 2.5%

TESTING ARRANGEMENT

25 A randomly selected "double blind" test was repeated 4 times in traps installed over trash cans modified to include spreaders comprising a supporting agent capable of absorbing/adsorbing and releasing the compositions to be tested and designed to emit said compositions.

30 The vegetal bait, namely cut-up cane, was arranged in a bundle on the bottom of the trap can. Feromone (Rhynchophorol) was released from small hermetic plastic 200 μm envelopes loaded with 0.2 cm^3 of synthetic feromone spreading a minimum of 2 mg/day through pores in the trap.

35 The reference specimen had only the small feromone

envelope as an attraction agent. Duration of the test was 1 month.

RESULTS

Overall results are shown in Table 1.

Table 1

Results for the months of March-April 1997

| Substance tested | Total capture | March 1997 | April 1997 |
|---------------------|---------------|---------------|---------------|
| | | Daily capture | Total capture |
| (a) | 72 | 0.6 | 119 |
| (b) | 18 | 1.5 | 312 |
| (c) | 20 | 1.7 | 405 |
| (d) | 218 | 1.8 | 420 |
| (e) | - | - | 3 |

15.

The total capture reflects the total number of insects (*Rhynchophorus palmarum*) trapped in all the traps containing the same test substance.

20. The daily capture reflects the number of insects (*Rhynchophorus palmarum*) captures per trap/day.

Results obtained reveal not only the efficacy of the attracting compositions provided by the invention but also the synergic effect achieved from including minority compounds - i.e. (a3) component- acetoin, phenol, guaiacol 25 and 2-phenylethanol in said compositions.

CLAIMS

1. A mixture suitable for producing an insect attracting composition that is useful for controlling insect pests in palm trees and related plants, comprising the following components:
- (a1) an organic compound selected from the group of compounds providing the main fermentation emission from vegetal portions of the palm tree or related plant; and
- (a2) a vegetal matter comprising vegetal portions from the palm tree or related plant that is ground, fermented and stabilized with a preserving agent.
2. A mixture according to claim 1, wherein said component (a1) is selected from the group formed by methanol and/or ethanol and/or ethyl acetate, and mixtures thereof.
3. A mixture according to claim 1, wherein said component (a1) is present in a varying amount by weight in respect to the total amount, comprised between 15 and 85% by weight, since the qualitative effect is as important, or more so, than the quantitative effect.
4. A mixture according to claim 1, wherein the vegetal portions of said component (a2) are selected from the group formed by stems, leaves, fruits and their mixtures.
5. A mixture according to claim 1, wherein said ground and fermented vegetal matter is either stabilized or not with a preserving agent selected among ascorbic acid, citric acid and their mixtures.
6. A mixture according to claim 1, wherein said component

(a2) is present in a suitable amount comprised between 15 and 85% by weight in respect to the total amount.

7. A mixture according to claim 1, which further
5 comprises a component (a3) selected from the group of
compounds forming the lesser fermentation emission from
palm tree and related plant vegetal portions.

8. A mixture according to claim 7, wherein said component
10 (a3) is selected from the group formed by isobutyl acetate,
acetoin, phenol, guaiacol, menthol, 2-phenylethanol and
mixtures thereof.

9. A mixture according to claim 7, wherein said component
15 (a3) is present in a suitable amount in respect to the
total amount comprised between 0 and 20% by weight.

10. A mixture according to claim 1, comprising 40% by
weight of ethyl acetate, 40% by weight of ethanol and 20%
20 by weight of ground, stabilized sugar cane.

11. A mixture according to claim 1, comprising 35% by
weight of ethyl acetate, 35% by weight of ethanol, 25% by
weight of sugar cane and/or coconut meat, ground and
25 stabilized with ascorbic acid, 2.5% by weight of phenol and
2.5% by weight of acetoin.

12. A mixture according to claim 1, comprising 35% by
weight of ethyl acetate, 35% by weight of ethanol, 20% by
30 weight of sugar cane and/or coconut meat, ground and
stabilized with ascorbic acid, 2.5% by weight of phenol,
2.5% by weight of acetoin, 2.5% by weight of guaiacol and
2.5% by weight of 2-phenylethanol.

35 13. A composition attractive to insects that is useful for

controlling pests of insects pertaining to the Coleoptera order in palm trees and related plants, comprising a mixture according to any of claims 1 to 12, and a feromone corresponding to the insect the pest of which is intended
5 to be controlled.

14. A method for controlling pests of insects pertaining to the Coleoptera order in palm trees and related plants, comprising the application of a composition attractive to
10 insects, according to claim 13, loaded with the feromone corresponding to the insect the pest of which is intended to be controlled in the course of protecting palm tree or related plant groves.
15. 15. A method according to claim 14, wherein said palm trees and related plants are selected from the group formed by all types and species of palm trees, and by sugar cane, banana

OFGS File No.: P/613-111(PCT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Jose Rafael ESTEBAN DURAN, et al.

Date: April 26, 2000

Serial No.: 09/508,032

Filed: March 6, 2000

For: COMPOSITION ATTRACTIVE TO INSECTS PERTAINING TO THE COLEOPTERA ORDER
AND ITS APPLICATION TO PEST CONTROL IN PALM TREES AND RELATED PLANTS

Hon. Commissioner of Patents and Trademarks
Box PCT (US/DO/EO)
Washington, DC 20231

REQUEST FOR REFUND AND
SUBMISSION OF SMALL ENTITY DECLARATION

Sir:

In absence of the Notification of Missing Requirements, enclosed herewith is an inventor's Declaration.

Pursuant to the Notice in the Official Gazette dated February 15, 1983, it is requested that a refund be granted in the amount of \$315.00 (see the attached calculation sheet), the amount overpaid on March 6, 2000 for filing the above application.

The verified statements claiming small entity status of the inventor and assignee are enclosed.

Also submitted is a copy of the documents cited in the International Search Report.

It is requested that the refund be deposited to our Deposit Account No. 15-0700. A duplicate copy of this Request is enclosed.

EXPRESS MAIL CERTIFICATE

I hereby certify that this correspondence is being deposited with the United States Postal Service as Express Mail Post Office to Addressee (mail label #EL008621840US) in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on April 26, 2000:

Dorothy Jenkins

Name of Person Mailing Correspondence

Dorothy Jenkins

Signature

April 26, 2000

Date of Signature

Respectfully submitted,

Edward A. Meilman

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Registration No.: 24,735

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Serial No. 09/508,032 Filing Date 3/6/2000 OFGS File No. 9613-11
Title COMPOSITION ATTRACTIVE TO INSECTS PERTAINING...
First Inventor J L ESEBAN DURAN, et al. Date 7/26/2000

The PTO has received:

Last Due Date: _____

- Patent Application of _____
 Pages (including claims & abstract)
 Declaration or Designation Sheet
 Drawings _____ Sheet(s)/Figs. _____ to _____
 Priority Document
 Small Entity Declaration *Request for refund*
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OFGS File No.: P/613-111(PCT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

Jose Rafael ESTEBAN DURAN, et al.

Date: May 16, 2000

Serial No.: 09/508,032

Group Art Unit: --

Filed: March 6, 2000

Examiner: --

For: COMPOSITION ATTRACTIVE TO INSECTS PERTAINING TO THE COLEOPTERA ORDER AND ITS APPLICATION TO PEST CONTROL IN PALM TREES AND RELATED PLANTS

Hon. Commissioner of Patents and Trademarks
Box PCT (US/DO/EO)
Washington, DC 20231

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JUN 6 2000
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RESPONSE TO NOTIFICATION OF MISSING REQUIREMENTS
UNDER 35 U.S.C. 371 IN THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)

Sir:

In response to the Notification of Missing Requirements under 35 U.S.C. 371 in the United States Designated/Elected Office (DO/EO/US), mailed May 3, 2000, we have previously submitted the Inventors' Declaration (copy enclosed) and paid the required fees on April 26, 2000 as evidenced by the attached copy of a postcard stamped by the U.S. Patent and Trademark Office.

In the event the actual fee is greater than the payment submitted or is inadvertently not enclosed or if any additional fee during the prosecution of this application is not paid, the Patent Office is authorized to charge the underpayment to Deposit Account #15-0700.

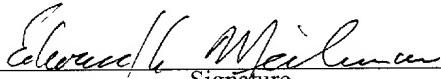
If this communication is filed after the time period had elapsed and no separate Petition is enclosed, the Commissioner of Patents and Trademarks is petitioned, under 37 C.F.R.

§1.136(a), to extend the time for filing a response by the number of months which will avoid abandonment under 37 C.F.R. §1.135. The fee under 37 C.F.R. § 1.17 should be charged to our Deposit Account No. 15-0700.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on May 16, 2000:

Edward A. Meilman

Name of applicant, assignee or
Registered Representative



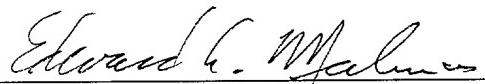
Signature

May 16, 2000

Date of Signature

EAM:mgs
Enclosures

Respectfully submitted,



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